D.T.E. 01-105

Petition of KeySpan Energy Delivery New England, pursuant to G.L. c. 164 § 69I, for approval by the Department of Telecommunications and Energy of its Long-Range Forecast and Requirements Plan for the forecast period 2001/02 through 2005/06.

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APPEARANCES: Thomas P. O'Neill, Esq.
KeySpan Energy Delivery New England
One Beacon Street
Boston, Massachusetts 02108
FOR: KEYSPAN ENERGY DELIVERY NEW ENGLAND
Petitioner

Cheryl M. Kimball, Esq.
Keegan, Werlin & Pabian, LLP
21 Custom House Street
Boston, Massachusetts 02110
FOR: KEYSPAN ENERGY DELIVERY NEW ENGLAND
Petitioner

Thomas F. Reilly, Attorney General
By: Wilner Borgella, Jr., Esq.
Regulated Industries Division
Public Protection Bureau
200 Portland Street, 4th Floor
Boston, Massachusetts 02114
Intervenor

Carol Wasserman, Esq.

Matthew T. Morais, Esq.
Division of Energy Resources
70 Franklin Street, 7th Floor
Boston, Massachusetts 02110

FOR: DIVISION OF ENERGY RESOURCES
Intervenor

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## I. INTRODUCTION AND PROCEDURAL HISTORY

On November 13, 2000, KeySpan Corporation merged with Eastern Enterprises, acquiring, in Massachusetts, the local gas distribution operations of Boston Gas Company ("Boston Gas"), Colonial Gas Company ("Colonial Gas"), and Essex Gas Company ("Essex Gas"). The combined operations are known as KeySpan Energy Delivery New England ("KeySpan" or "Company"). KeySpan is a regulated natural gas distribution utility, headquartered in Boston, Massachusetts, and currently serves approximately 500,000 customers, primarily in eastern Massachusetts and on Cape Cod (KEY-1, Table G-1).

On November 30, 2001, pursuant to G.L. c. 164, § 69I, KeySpan filed with the Department of Telecommunications and Energy ("Department") a petition for approval of its Long-Range Forecast and Requirements Plan ("Forecast and Supply Plan") for the forecast period 2001/02 through 2005/06. The petition was docketed as D.T.E. 01-105, and is the subject of this proceeding.

Pursuant to notice duly issued, the Department conducted a public hearing and procedural conference at its offices in Boston on January 31, 2002. The Department granted intervenor status to the Division of Energy Resources ("DOER") and to the Attorney General of the Commonwealth ("Attorney General").

The Department conducted an adjudicatory hearing at its offices on July 17, 2002. The Company presented three witnesses in support of its Forecast and Supply Plan: Leo Silvestrini, Director of Rates and Regulatory Affairs for KeySpan; Theodore E. Poe, Jr., Manager of Energy Planning for KeySpan; and Elizabeth Danehy, KeySpan's Director of Customer Choice and Gas Resource Management. The evidentiary record consists of the Company's initial

petition, approximately 313 information requests and responses, and 17 record requests and responses. The Company and DOER each submitted an initial brief and a reply brief; the Attorney General submitted an initial brief.

## II. ANALYSIS OF THE LONG-RANGE FORECAST

### A. Standard of Review

Pursuant to G.L. c. 164, § 69I, the Department is required to ensure "a necessary energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost." In accordance with this mandate, the Department reviews the long range forecast of each gas utility to ensure that the forecast accurately projects the gas sendout requirements of the utility's market area. G.L. c. 164, § 69I. A forecast must reflect accurate and complete historical data, and reasonable statistical projection methods. G.L. c. 164, § 69I; 980 C.M.R. § 7.02 (9)(b). Such a forecast should provide a sound basis for resource planning decisions. Colonial Gas Company, D.P.U. 96-18, at 4 (1996); BayState Gas Company, D.P.U. 93-129, at 5 (1996); Holyoke Gas and Electric Department, D.P.U. 93-191, at 2 (1996); Berkshire Gas Company, 16 DOMSC 53, at 56 (1987).

In its review of a forecast, the Department determines if a projection method is reasonable based on whether the methodology is: (a) reviewable, that is, contains enough information to allow a full understanding of the forecast methodology; (b) appropriate, that is, technically suitable to the size and nature of the particular gas company; and (c) reliable, that is, provides a measure of confidence that the gas company's assumptions, judgments, and data will forecast what is most likely to occur. D.P.U. 96-18, at 5; D.P.U. 93-129, at 5; D.P.U. 93-191, at 2; Haverhill Gas Company, 8 DOMSC 48, at 50-51 (1982). Specifically,

the Department examines a gas company's: (1) planning standards, including its weather data; (2) forecast method, including the forecast results; and (3) derivation and results of its design and normal sendout forecasts. See D.P.U. 93-129, at 5-6; see also Boston Gas Company, D.P.U. 94-109 (Phase I), at 9 (1996). As part of the review of the forecast, the Department also examines the company's scenario analysis, which is used for evaluating the flexibility of the company's planning process, including any cold-snap analysis[1] and sensitivity analysis. Boston Gas Company, 25 DOMSC 116, at 200 (1992) ("1992 Boston Gas Decision"); D.P.U. 93-129, at 23-25 and D.P.U. 94-109 (Phase I), at 61-66.

B. Previous Forecast Reviews

KeySpan's filing in this proceeding represents the first Forecast and Supply Plan to be filed on a combined basis by Boston Gas, Colonial Gas, and Essex Gas. The Department treats the filing as a fresh start for KeySpan because this is the first time the Company has formulated a Forecast and Supply Plan based on a single forecasting methodology and uniform planning standards for the integrated KeySpan system. Prior to this filing, Boston Gas, Colonial Gas, and Essex Gas used different forecasting methodologies and different planning standards to formulate their forecast and supply plans. For this reason, the Department does not view the earlier forecast and supply plan reviews for the previously separate companies to be relevant to this proceeding.

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[1] A cold-snap is a prolonged series of days at or near design conditions. Colonial Gas Company, D.P.U. 93-13, at 66 (1995); 1992 Boston Gas Decision at 217; Commonwealth Gas, 17 DOMSC 71, at 137 (1998).

C. Planning Standards

The first element of the Department's forecast review is an assessment of a company's planning standards because of their critical importance to a forecast. A company's planning standards are used as a basis for projecting its sendout forecast, which, in turn, is used for ascertaining the adequacy and cost of a company's supply plan.

The Department's review of planning standards begins with a review of a company's weather data. The accuracy of weather data is important because weather data are the basic inputs upon which a company's planning standards are based. The second step of the Department's review is an analysis of the planning standards themselves -- how a company arrived at its design-day and design-year standards. The Department reviews a company's planning standards to ensure that they are reviewable, appropriate, and reliable.

1. Weather Data

a. Description

In order to perform a statistical analysis to determine its design-day and design-year standards, KeySpan maintains a record of daily effective degree days ("EDDs")[2] based on observations taken at the Logan International Airport ("LIA") weather station for the period January 1981 through December 2000 (Exh. KEY-1, at 79-81). The Company also maintains a record of the coldest day for each of the past twenty years, taken from the LIA weather data (Exh. KEY-1, at 81). KeySpan states that it used the LIA weather data to represent weather

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[2] A degree day ("DD") is a measure of the coldness of the weather experienced, based on the extent to which the daily mean temperature falls below sixty-five degrees Fahrenheit. An EDD takes into account wind speed in determining the coldness of the weather. D.P.U. 96-18, at 6.

conditions in the Company's service territory because LIA is geographically centered within the Company's service territory, and also because of the high correlation between the EDD values for LIA and those in other areas of the service territory ( Exh. D.T.E. 1-1).

b. Analysis and Findings

KeySpan has demonstrated graphically and statistically that the LIA weather data are representative of weather conditions in the Company's service territory (Exh. D.T.E. 1-1). Because the Company's current weather data are from a weather station which is centrally located within its service territory, and are based upon data sets encompassing a substantial historical period, including recent observations, the Department concludes that KeySpan's weather data appear to be accurate, reliable and appropriate for use in establishing the Company's planning standards. The Department also finds that the 20 years' worth of data which the Company used in establishing its planning standards appropriately reflects the Company's experience. In addition, the Company's database is comparable to other databases previously approved by the Department. North Attleboro Gas Company, D.T.E. 01-47, at 5; D.P.U. 96-18, at 7; D.P.U. 94-109, at 10. Accordingly, the Department finds that the weather data used by KeySpan are reviewable, appropriate, and reliable.

2. Design-Day Standard

a. Description

KeySpan states that it used daily EDD values from its weather database for the period 1981 to 2000 and applied a three-step process to establish its design-day standard.[3]

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[3] The design day represents the coldest day for which the company plans to provide

(continued…)

(Exh. KEY-1, at 81). First, the Company performed a statistical analysis of the coldest days recorded during the 20 year period, which showed that the 20 data points were normally distributed with a mean EDD value of 66.5 EDD and a standard deviation of 5.5 EDD (id.).

The Company next performed a cost-benefit analysis to compare the cost of maintaining resources necessary to meet design-day demand, to the cost to customers of experiencing service curtailments (id. at 80). The Company determined the probability-weighted costs of damages[4] to residential and commercial and industrial ("C&I") customers separately, in the event a service curtailment should happen (id. at 82). For residential customers, the Company calculated the costs of damages associated with two categories of avoided costs: (1) re-light expenses[5] and (2) freeze-up costs[6] (id. at 81). For C&I customers, the Company calculated the costs associated with economic damages resulting from loss of production during a curtailment (id. at 82). The Company states that in addition to estimating the costs to residential and C&I customers from a service curtailment, it estimated the costs associated with maintaining adequate deliverability at different EDD levels (id. at 83). Third, the Company states that it identified a

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[3](…continued)
reliable firm service.

[4] The probability-weighted costs of damages refers to the probability of exceeding the mean peak EDD of 77.7 established by taking the average of each of the coldest days recorded over the last twenty heating seasons (id., Chart III-E-4).

[5] The Company estimated residential re-light expenses, calculated in 2000 dollars, to be $70.54 per customer (id.).

[6] The Company estimated residential freeze-up costs, calculated in 2000 dollars, to be $39,348.99 per customer, based on information provided by Marsh & McLennan, a property loss consulting firm (id. at 82, Chart III-E-4).

design-day standard that would maintain reliability on KeySpan's system at the lowest cost (id. at 81).

Following the three-step process described above, the Company determined a range for a design-day planning standard of 75 EDD to 82 EDD with a midpoint of 77.7 EDD, or approximately 78 EDD (id. at 83). The Company states that the 78 EDD design day standard corresponds to a probability of occurrence of once in 46.69 years (id. at 80). The Company explains that the current 78 EDD design day standard is just one EDD greater than the 77 EDD recorded on December 25, 1980, which is the coldest day in the LIA weather-site data since 1971 (id.).

b. Analysis and Findings

In Bay State Gas Company, 19 DOMSC 140, 158-159 (1989), the Energy Facilities Siting Council ("Siting Council") indicated that the purpose of requiring an analysis to examine the balance between cost and reliability as they relate to planning decisions is to ensure that the utility is reasonably weighing the objectives of cost and reliability. The Siting Council posited that excessively high design criteria would cause a utility to construct facilities indiscriminately and enter into agreements to prepare for any and all eventualities. Id. at 159. Instead, an appropriate and reliable analysis ensures that the utility weighs the objectives of cost and reliability reasonably and plans for a reliable level of service, while not wasting customers' money by spending above that level. Id.

The Department has recognized this tension between the conflicting goals of safeguarding reliable, uninterrupted gas service, which may require LDCs to procure resources in excess of their peak requirement, and ensuring that costs to the LDC's customers are low.

D.P.U. 94-109 at 25. In that proceeding, the Department found that Boston Gas Company's design-day standard of 83 EDD with a probability of occurrence of once-in-424 years, while reviewable and appropriate to the size and nature of the Company, was not reliable because the assumptions, judgements, and data used by the Company did not forecast what was most likely to occur. Id.

The Department's design-day criteria also require an LDC to develop a statistically-derived design day standard and to analyze the cost implications of at least two levels of reliability as part of its analysis establishing the design day standard. Fall River Gas Company, D.T.E. 99-26, at 10. The analysis requires an LDC to account for the changes that affect both demand and supply conditions in the natural gas market.

At issue in this proceeding is whether KeySpan has established a reviewable, appropriate and reliable design-day standard that promotes both cost-effective and reliable resource planning. The Company has taken steps to balance the benefits of providing a reliable service against the costs of providing such services to customers in establishing its design-day standard. The Company has also updated its analytical procedures in determining its design-day standard by using updated cost estimates obtained from Marsh & McLennan ("MML"), and by reexamining and updating the potential re-light costs which it used in the cost-benefit analysis (Exh. KEY-1, at 82). KeySpan followed appropriate statistical and analytical procedures in establishing its design day standard of 78 EDD. The Company used, for example, probability-weighted cost of damages to calculate the cost to residential customers of a service curtailment ( Exh. KEY-1, Chart III-E-4 and Chart III-E-5). Finally, the Department finds that the Company's design-day standard of 78 EDD is comparable to the design-day

standards of other similarly situated LDCs in Massachusetts which the Department approved. See D.T.E. 01-47, at 9-12; Boston Gas Company, D.P.U/D.T.E. 97-81, at 6-10 (2000)). Based on the foregoing, the Department finds KeySpan's design-day standard to be reviewable, appropriate, and reliable.

3. Normal-Year Standard

a. Description

KeySpan states that it developed its normal year standard[7] using 20 years' worth of weather data for the period January, 1981 to December, 2000 (Exh. KEY-1, at 79-81). In developing the normal-year standard, the Company first calculated the average number of EDD using weather data covering the 20 year period (id. at 79). The Company found the EDD values to be normally distributed, with an average of 6,461.90 EDD and a standard deviation of 340.73 EDD (id.). The Company next selected from its weather database the month that came closest to the twenty-year average EDD and standard deviation for each month, to establish the normal year standard of 6,462 EDD (id. at 79, 86 and Chart III-E-1).

b. Analysis and Findings

The Department has previously accepted the use of an arithmetic average of historical DD and EDD weather data to establish a normal year. D.T.E. 01-47, at 7; D.T.E. 99-26, at 5-6; D.P.U.96-18, at 9). KeySpan based its normal-year standard on an historical average of weather data that appear to be accurate, reliable and representative of weather conditions in its

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[7] The normal year standard is the demand profile associated with the average, or "typical" temperature level that can be expected over the course of a year.

service territory. The Department therefore finds that the method used by KeySpan to establish its normal year standard is reviewable, appropriate, and reliable.

4. Design-Year Standard

a. Description

KeySpan states that the Company's goal in developing a design-year standard[8] is "to identify the amount of seasonal supplies of natural gas that will be required to provide continuous service under all reasonable weather conditions." (Exh. KEY-1, at 84). The Company developed its design year standard using 20 years' worth of historical weather data for the period January, 1981 to December, 2000 (id. at 79-81). The Company explains that in establishing the design year standard it followed a three-step process (id. at 84). First, it performed a statistical analysis of annual EDD data for the 20 year period, 1981 through 2000, which showed that the data are normally distributed with a mean EDD of 6,462 (id. at 85 and Chart III-E-1).

Next, the Company conducted a cost-benefit analysis to compare the benefit of maintaining an adequate supply under all reasonable weather conditions to the probability-weighted cost to customers of not maintaining an adequate supply leading to service curtailments (id. at 84). The Company explains that it viewed the costs associated with any service curtailments on a seasonable basis as an economic cost or penalty imposed on its service territory as a whole, hence it estimated potential losses[9] based on the product of the potential

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[8] Design-year is the coldest year for which a company plans.

[9] The Company explains that it calculated the potential losses by using data provided by

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economic cost per day of service curtailment multiplied by the total number of days of service interruption[10] (id. at 85).

In the third step, the Company used the results of steps 1 and 2 as described above to identify a design-year standard that would ensure an adequate and a reliable supply at the lowest cost (id. at 85). By following the three-step process described above, the Company established a design-year planning standard which falls within a range of 7,000 EDD to 7,200 EDD with a midpoint of 7,120 EDD (id. at 88). The Company explains that the 7,120 EDD design-year standard corresponds to the probability of occurrence of once in 37.43 years (id.).

b. Analysis and Findings

In its 1986 Gas Generic Order, 14 DOMSC 95, at 96-97, 104-105 (1986) ("1986 Gas Generic Order") the Siting Council notified gas companies that it would place renewed emphasis on design criteria "to ensure that those criteria bear a reasonable relationship to design conditions that are likely to be encountered." The Department finds that KeySpan has complied with Department directive in this area by using a probabilistic analysis to establish its design-year standard.

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[9](…continued)
Data Resources, Inc., to determine the average Gross State Product per day (GSP/day) for the year 2000, which it then used as input into calculating the economic cost to its customers per day (id. at 85-86).

[10] The Company explains that it determined the number of days of service interruption by analyzing its supply requirements at various EDD levels, then assigned the requirements to various supply sources and, finally, using 6,462 EDD as the baseline, estimated when, how much, and how long it would experience a supply deficit (id. at 86-88, Chart III-E-8, Chart III-E-9, Chart III-E-10, and Chart III-E-11).

The Department also finds that KeySpan has performed an adequate cost-benefit analysis to compare the benefit of maintaining an adequate supply under different planning standards to the probability-weighted cost of service curtailment. The Department finds that the data used by the Company to estimate the actual costs associated with service curtailment are reliable, and that the assumptions underlying the cost-benefit analysis are reasonable. The Department concludes that the Company presented a credible analysis in support of its use of a one-in-37 year standard. The Department, therefore, finds that the method and data used by KeySpan to determine its design-year standard are reviewable, appropriate, and reliable.

5. Cold Snap Planning Standard

a. Description

KeySpan evaluated the ability of its current resource portfolio to meet sendout requirements should a cold snap occur by establishing a cold snap planning standard (Exh. KEY-1, at 126-127). The Company established its cold snap planning standard using 20 years' worth of weather data covering the period 1981 to 2000 (id.). Using the SENDOUT® Model[11], the Company modeled daily sendout to predict resource usage over a specified range of EDD values (id.). The results show that the mean total EDD for the last two weeks of

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[11] The SENDOUT® model is used for integrated resource planning in the natural gas industry. Specifically, it is used, among other things, to determine the optimal capacity levels of supply, transportation and storage for various scenarios (high/low supply prices, demand growth, emerging markets, customers lost to transport, etc.) for multi-year planning horizons; to evaluate the cost and service implications of changing the design level of service (e.g., coldest winter on record vs. coldest winter in last ten years), including the revenue generated from capacity release (i.e. peak day planning); and to develop supply, transportation and storage targets (capacity, price, operating flexibility) to guide on-going contract negotiations and capital investments. The SENDOUT® software was developed by NewEnergy.

February is 480.4 with a standard deviation of 70.7 EDD (id.). The Company notes that a once-in-50 year occurrence will result in a 626 EDD above the mean, which is 2.06 times the standard deviation (id.).

To establish its 14-day cold snap planning standard the Company selected the actual or observed coldest days during the period February 15-28 (id.). The coldest days during the period February 15-28 occurred in 1993 and had an EDD value of 625 (id.). The Company then scaled-up the actual daily data during this time frame to model a two-week period of design cold snap (id.). The Company calculated the probability of occurrence for its cold snap scenario to be once in 50 years (id.).

Using the base-case demand and the SENDOUT® model, the Company performed a simulation analysis to examine the effectiveness of its portfolio in meeting customer demand during normal weather from November 1 through February 14, the two-week cold snap, followed by normal weather (id. at 127). The results of the cold snap simulation indicate that the Company's portfolio was adequate to meet any cold snap requirements during the forecast period (id.).

b. Analysis and Findings

The Department has defined a cold snap as a prolonged series of days at or near design conditions. Colonial Gas Company, D.P.U. 93-13 at 66; 1992 Boston Gas Decision, 25 DOMSC at 217. For evaluation purposes, an LDC must demonstrate to the Department that the aggregate resources available are adequate to meet this near-maximum level of sendout over a sustained period of time, and that it has and can sustain the ability to deliver such resources to its customers (id.).

KeySpan developed its cold snap planning standard using 20 years' worth of weather data for its service territory. The use of 20 years' worth of historical weather data in establishing a cold snap planning standard is consistent with recent Department directives. D.T.E. 01-47, at 12-13. The Department notes that KeySpan developed its cold snap planning standard by defining a cold snap as 14 consecutive days of protracted, very cold weather. This definition is comparable to the definitions approved by the Department in recent cases and should afford customers an additional level of supply security in the event of an extended cold snap. Id.

The Department also notes that KeySpan used appropriate statistical and simulation methods to develop its cold snap planning standard, and that the SENDOUT® model used by the Company is widely used in the industry and by LDCs in Massachusetts for integrated resource planning. The Department, therefore, finds KeySpan's analysis to determine its cold snap planning standard to be reviewable, appropriate, and reliable. The Department also concludes that the cold snap planning standard presented by KeySpan is reviewable, appropriate, and reliable.

6. Conclusions on Planning Standards

The Department has found that KeySpan used: (1) reviewable, appropriate, and reliable weather data in the development of its planning standards; (2) a reviewable, appropriate, and reliable design day standard; (3) a reviewable, appropriate, and reliable normal year standard; (4) a reviewable, appropriate, and reliable design year standard, and (5) a reviewable, appropriate, and reliable cold snap planning standard. Accordingly, the Department finds that the Company's planning standards are reviewable, appropriate and reliable.

D. Forecasting Methods

1. Introduction

The Company's forecast methodology is the same as that approved by the Department in Boston Gas Company, D.P.U. 97-81 (2000), with updates of a number of the mathematical models used in the forecasting process (Exh. KEY-1, at 33). The Company applied "end-use modeling" methodology to forecast incremental demand by traditional end-uses (id.).[12] The Company forecasts demand by adding annual increments to its 2000-2001 normalized actual sendout (id.). Inputs for the residential sector forecast include energy consumption by household and building type, the number of households by city and building type, and the end-use distribution of energy using equipment by building type (id. at 39). For the C&I sector forecast, the Company used employment figures for the Company's service territory by region and Standard Industrial Code ("SIC"), oil and gas price projections, equipment and building stock energy efficiencies, and equipment replacement rates (id.).

The Company also developed forecasts for its non-traditional customer segments such as natural gas vehicles, seasonal firm sales made under special contracts, and natural gas used in large-scale power generation (Exh. KEY-1, at 35-36). KeySpan combined these two forecasts to derive the total Company forecast (id. at 36). The Company noted that it applies its end-use modeling to traditional customers only (id. at 33).

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12 The Company defines the "end-use modeling" as a bottom-up approach that simulates the behavioral patterns of individual customers as they make choices about energy equipment, energy sources and consumption levels (Exh. KEY-1, at 39). This methodology projects total energy demand in the service territory by end use and fuel, including natural gas (id.).

2. End-use Modeling

The Company holds that its end-use model is able to accommodate the entire KeySpan service territory because there is no geographical limitation on the model's utilization (id. at 38). Accordingly, the Company updated the model to include data on households, employment, and company-specific load data for those counties previously served by Essex Gas and Colonial Gas (id.).

The Company states that its end-use methodology forecasts the total energy demand by end-use and by fuel type, including natural gas (id. at 39). End-use includes space heating, water heating, cooling, lighting, cooking, drying, and other appliances in the residential and C&I sectors (id.).

The Company's end-use methodology applies a bottom-up approach that simulates the behavioral patterns of individual customers as they make choices about energy equipment, and energy sources and consumption levels (id.). The Company's end-use model also simulates how consumption levels respond to changes in energy prices (id. at 40). Thus, KeySpan estimated the incremental energy demand for each market and determined the share of the energy demand that will be met by natural gas (id.). The Company used the following three-step process to forecast demand:

1) The Company determined energy demand by region, building type, end-use and fuel type (i.e., gas, electricity, and oil) based on a 1997 energy use study that incorporated the Company's sales data and other sources (id.);

2) The Company developed annual incremental demand forecasts beyond 2001 by market segment under normal weather conditions that take into account the separate forecasts of economic and demographic growth, fuel price developments, equipment replacement rates and equipment efficiency assumptions (id.);

3) The Company converted its annual demand (i.e., annual sales) estimates to sendout requirements by adjusting sales for unaccounted-for and Company-use gas (id.).

3. Base Year Energy Demand

The Company updated its base year total energy demand from 1991 to 1997 (id. at 38). Total demand for the residential and C&I classes was broken down by building type, city, end-use and fuel type (id. at 41).

a. The Residential Base Year Model

As a first step in developing the Residential Base Year Model, the Company multiplied the total number of households in its service territory by the energy consumption per household by building type (id. at 42). The Company then estimated the total 1997 base year energy demand by end-use, using data from the Boston Gas Home Energy Use Survey (1998), the XENERGY Report (2000)(the "XENERGY Report") [14], and historical data of the Company (id.). Next, the Company estimated average energy use per appliance based on information from the Company's CSS database and Boston Gas Company's Home Energy Use Survey (id.). Finally, the Company obtained the total energy demand for each appliance in the 1997 base year by multiplying the number of each appliance type by the appliance energy intensity factors (id.). KeySpan separated the total energy demand by end use into fuel types (electric,

[14] Boston Gas contracted with XENERGY, Inc. to review and update the data and algorithms supporting the End-Use Model (Exh. KEY-1, at 38, n. 30). The results of the review and of the updating are presented in a report: "Research for New Boston Gas Energy Demand Model - Final Report", March 24, 2000 (id.).

gas and oil) using Company data for gas sales, and an Estimated Energy Intensity Factors table prepared by XENERGY, Inc. ("XENERGY") (id. at 43).

b. Commercial/Industrial Base Year Model

The Company's C&I base year model estimated the total energy demand by city, SIC Code, end-use and fuel type (id.). The forecast is based on employment projections in the C&I sector (id.). The Company relied on: (1) employment data for its service territory, (2) energy intensity factors from the XENERGY Report study reflecting energy consumption per employee, and (3) fuel market shares calculated by analyzing Company sales records and information provided by XENERGY (id.).

To derive the total energy consumption by SIC Code, the Company used employment data for each code, which it then multiplied by energy use factors estimated by XENERGY (id.). Next, the Company calculated energy consumption by end-use (id.). Thus, the Company obtained total energy demand estimates by SIC and by end-use (id.). Finally, the Company estimated the shares of fuels in total energy by using a "balancing algorithm" that took into account assumptions about gas sales by SIC Code from Company records, market share of oil and electric sales using data from XENERGY, and the relationship between fuels and end-uses (id. at 44).

4. Forecasting Annual Incremental Demand

Following the estimation of the base-year energy demand, the Company forecasted annual incremental demand for each market segment, relying on the forecast values of driver

variables (id.).[15] The Company's model distinguishes between new and existing establishments (id.). The Company estimated both gross and net load additions for each market segment. Gross load additions refer to increases in gas consumption due to installation of gas-fired equipment in all types of (old and new) buildings. Net incremental additions are the difference between the current year's gas throughput volumes and the previous year's volumes (id. at 44-45). KeySpan's net load additions take into account both load gains and load losses such as changes in gas consumption due to replacement of older equipment with newer, more efficient equipment, the effect of demand side management ("DSM ") programs and fuel price elasticities (Exh. KEY-1, at 45).[16]

The Company projects that over the forecast period there will be 24,592 BBtu of gross additions to total throughput (id.).[17] Net throughput additions over the forecast period total 13,292 BBtu (id.). Based on the forecast results, KeySpan expects its sendout requirements for traditional markets to grow 13.5 percent over the forecast period, or 2.6 percent per year (id.).

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15 The driver variables are economic and demographic growth rates, fuel prices and equipment replacement rates, and equipment efficiency assumptions (Exh. KEY-1).

16 "The price elasticity of demand is a measure of how sensitive quantity demanded is to a change in price. It can be defined as the percentage change in quantity demanded divided by the percentage change in price." Edgar K. Browning and Jacquelene M. Browning, Microeconomic Theory and Applications", 2nd ed., at 89 (1986).

17 This includes 22,230 BBtu in the traditional core markets and 2,362 BBtu in the natural gas vehicle market (id. at Chart III-B-5).

The Company presented its market segment forecasts as follows:

a. Residential Market

KeySpan states that for all residential structures with one to four units, the annual gross and net loads will increase by an average of 1,795 BBtu and 1,293 BBtu, respectively over the forecast period, representing an overall increase in the residential sendout of 2.1 percent per year (id. at 46). The Company forecasts residential end-use demand separately for new and existing households.

i. New Residential Households

The Company's forecast of new residential households is based on projections of the number of new households and fuel choice decisions for the energy equipment in those new households (id.). The Company used county level forecasts adjusted for its service territory (id.). The 2001 forecast indicates a 0.69 percent growth rate in the number of households over the forecast period (id. at 47).

Next, the Company determined the number of appliances that will be added to the newly constructed units by fuel type (id.). Finally, the Company calculated the total energy consumption by fuel type through appliance use factors and reached the annual incremental demand for new units by building size, fuel type, and end use within the KeySpan service territory (id.).

ii. Existing Residential Households

The Company relied on simulation results of equipment replacement decisions and annual energy consumption levels among existing households (id.). The Company states that the equipment replacement decision is affected by appliance type, fuel use, replacement rate of

the existing equipment and replacement market shares by fuel type for each appliance (id.). KeySpan's model estimates changes in energy consumption per appliance and indicates that the use per appliance among existing customers tends to decline due to the higher efficiency of new equipment (id. at 48). KeySpan obtained data on energy-equipment fuel type and replacement rates from Boston Gas Company's Home Energy Use Survey and the research prepared by XENERGY (id. at 47).

The annual energy demand for existing households is assumed to be price elastic (id. at 48). The Company's projections for burner-tip gas prices indicates an average annual compound rate of 5.1 percent decline over the forecast period (id.).

b. Apartment House Market

The Company's demand forecast for apartment houses (residential structures with five or more units) indicates that a gross and a net incremental load addition of 1,707 BBtu and 1,417 BBtu, respectively, are expected over the forecast period (id. at 49). This represents a 12.3 percent increase in sendout volume during the forecast period, or 2.3 percent per year (id.). The Company used separate end-use models to forecast demand for new and existing apartment houses (id.).

i. New Apartment House Market

The Company forecasts demand for the new apartment house market segment by projecting the number of new households and by simulating the fuel choice decisions for new energy equipment (id. at 50). The Company used data from DRI-WEFA, Inc. ("DRI-WEFA") for the growth in the number of households by building type at the county level. KeySpan then

adjusted this data for its service territory (id.). The forecast for the new apartment house market indicates an average annual growth rate of 0.69 percent over the forecast period (id.).

Next, the Company simulated the decision making process of selecting fuels for new energy equipment by estimating the net present value of the cost of installing and operating energy equipment for each competing fuel (id.). Then, the Company employed the algorithm developed by XENERGY and embedded in the end-use model to calculate the probabilities of outcome on the shares of gas and oil-fired equipment (id.). The model also adjusted energy use factors for each appliance to reflect the higher efficiency of new equipment (id.). Finally, the Company developed the annual incremental energy consumption by fuel type and end-use for the new apartment house market (id.).

ii. Existing Apartment House Market

For the existing apartment house market, the Company used simulation results of equipment replacement decisions and annual energy consumption levels (id. at 51). The Company states that the equipment replacement decision is a function of the share of existing equipment due for replacement each year and the comparative costs of installing and operating gas-fired equipment versus alternatives (id.). Similar to the existing residential market, the Company's model estimates changes in energy consumption per appliance which tends to decline due to the higher efficiency of new equipment (id.).

The annual energy demand in the existing apartment house market, similar to the existing household market, is assumed to be price elastic (id.). The Company used fuel price projections based on DRI-WEFA commodity price forecasts, the NYMEX index for natural gas and No.2 heating oil futures prices, and KeySpan data on distribution margins and long-

haul transportation costs (id.). The Company's projections for burner-tip gas prices indicates an average annual compound rate of 5.0 percent decline over the forecast period (id. at 52).

c. Commercial and Industrial Market

The Company's C&I demand forecast shows 11,549 BBtu and 9,043 BBtu of gross and net incremental loads, respectively, during the forecast period (id.). This represents an overall increase in C&I sendout of 17.4 percent, or 3.3 percent per year (id.).

i. New Commercial and Industrial Markets

The Company's end-use model for the new C&I markets forecasts demand on the basis of employment projections and the simulation of fuel choice decisions for new energy equipment (id. at 53). To calculate total energy demand, the Company used employment projections by SIC Code for its service territory and the energy use per employee factors provided by XENERGY (id.).

The Company next determined market share by fuel type for new C&I equipment (id.). The Company estimated the net present value of the cost of installing and operating energy equipment for each competing fuel (id.). Next, the Company used a choice model developed by XENERGY that calculates the probabilities of outcome on the share of gas and oil fired equipment (id.). The end-use model then adjusted energy use factors for each appliance to reflect the better efficiency of new equipment (id.). In addition, the model estimates the gas market share in the KeySpan service territory (id. at 54). Finally, the Company developed a forecast of gross energy demand for new C&I markets by SIC Code, fuel type and end-use in the service territory (id.).

ii. Existing Commercial and Industrial Markets

KeySpan forecasts demand in the existing C&I market segments by simulating equipment replacement decisions and annual energy consumption (id.). According to the Company, the equipment replacement decision is a function of the share of existing equipment due for replacement each year, and a comparative cost analysis of installing and operating gas-fired equipment versus alternatives (id.). The model takes into account efficiency levels of replacement equipment and the share of natural gas in the replacement market (id.).

The Company determined that annual demand in this market is price elastic (id.). The Company's fuel price projections were based on DRI-WEFA commodity price forecasts, NYMEX index for natural gas and No.2 heating oil future prices, and KeySpan's data on distribution margins and long-haul transportation costs (id.). The burner-tip gas prices are projected to decline at an average annual compound rate of 6.0 percent (id. at 55). That decline is not smooth. In 2002 and 2003, the first two years of the forecast, prices decline by 20 and 5 percent, respectively. Thereafter, the rate of decline decreases and is relatively stable over the last two years. These result in the projected decline in the planning period (id.). Considering the negative price elasticity of gas, the Company expects an increase in consumption following the decline in burner-tip prices over the forecast period (id.).

d. Non-Traditional Markets

i. Natural Gas Vehicles

The Company forecasts 2,362 BBtu of load additions in the natural gas vehicles ("NGV") market throughout the planning period, including additions from C&I, government, and intra-city and school bus fleets (id.). The Company's forecast is based on its NGV

marketing and investment strategy, which evaluated current and future market drivers and barriers, and assessed their likely effect on Company load additions (id. at 56). The Company's strategy targeted the fleets which: (1) are mandated to convert to cleaner fuels, (2) are made up of vehicles with high fuel use characteristics, (3) can locate refueling facilities on-site rather than rely on public fueling stations, and (4) are eligible for financial and tax incentives for alternate fuel vehicles (id. at 57-59).

The Company states that there are several barriers in the market place working against the development of a NGV market, including restrictions on underground garage parking, a lack of accessible maintenance facilities for NGVs, a limited number of compressed natural gas refueling sites, relatively low gasoline prices, an incremental cost of $3,000-$5,000 for the compressed natural gas option in most high-duty vehicles, and the high capital cost to construct fueling stations (id. at 59). Also, the Company notes that NGVs face competition from electric, reformulated gasoline, and biodiesel vehicles (id. at 59).

ii. Seasonal Firm Gas Sales

The Company expects that the firm seasonal load will decrease by 3,150 BBtu by the end of 2005 as a result of the termination of the Company's firm-sales agreements with MATEP, Wellesley College and Brandeis University (id. at 59). However, the Company expects MATEP, Wellesley College, and Brandeis University will convert to transportation when their contracts expire (id. at 59).

iii. Large-Scale Power Market

The Company indicates that natural gas demand for the large-scale power generation market will not affect the Company's sendout requirements or resource plan during the forecast

period because: (1) all power generation previously served by the Company converted to transportation before the date of the instant filing, and (2) the Company is not currently aware of any plans to locate a large-scale gas fired power generation plant in its territory over the forecast period that does not yet have its gas requirements in place (id. at 60). In the event a new plant is built, the Company states that such facilities would be served by third party gas suppliers (id.).

iv. Demand Side Management

The Company states that it is in the final year of a five-year energy efficiency program approved by the Department on April 18, 1997 (id.). The Company submitted a new energy efficiency program to the Department for review in June, 2001, and the Department approved the extension of the Company's DSM programs through April 2007 (id. at 61).[18]

The Company indicates that it used a model ("Energy Efficiency Model") developed in the NSTAR Energy Efficiency Collaborative to project the future energy-savings resulting from implementation of its DSM programs (id.). The Company updated the Energy Efficiency Model to reflect current assumptions relating to program costs and benefits, program participation, the discount rate, and avoided natural gas costs (id.). Based on its assumption that funding of DSM programs will continue through April 30, 2004, KeySpan estimated average DSM-related volume reductions of 569 BBtu per year during the forecast period (id. at 61-62). The Company indicated that reductions of customer requirements which result from

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[18] KeySpan Energy Delivery New England, D.T.E. 02-31 (June 6, 2002).

implementation of DSM programs are taken into account in the sendout forecast (id. at 122; Exh. DTE 2-10).

v. Transportation Migration

The Company states that it currently has a comprehensive customer-choice program that provides all customers with an opportunity to share the benefits provided by increased competition in the retail market for natural gas since: (1) the Company introduced Boston Gas Company's C&I transportation program into the Colonial Gas and Essex Gas service territories in May, 2000; and (2) the Company implemented terms and conditions for transportation service for all customers in the KeySpan service territory on November 1, 2000 (id. at 62).

KeySpan states that it formulated its transportation migration forecast based on the actual historical experience of Boston Gas from the beginning of 1997 to 2001 (id. at 62-63). The Company asserts that the transportation program administered by Boston Gas was substantially similar to the transportation program currently in place for the KeySpan service territory and, therefore, the historical transportation migration data for Boston Gas represents the most relevant data available to serve as a basis for projections of customer migration over the forecast period (Exh. D.T.E. 1-25).

(A) Transportation Migration Forecast

The Company indicates that the total forecasted transportation volumes will increase from 20,585 BBtu in 2002 to 22,762 BBtu in 2006 (Exh. KEY-1, at 63) and that the forecasted transportation load percentage will remain constant at 18.8 percent over the forecast period (id. at Chart III-B-9). The Company calculated these migration patterns by projecting total gas

throughput on its system over the forecast period, and then estimating the portion of that throughput that would be delivered under transportation service (id. at 63).

KeySpan grouped the transportation market into three tiers, representing similar migration patterns. Tier 1 consists of the residential (Rates R-1 and R-3) and small C&I customers (Rates G-41 and G-51), who have experienced the slowest migration rates (id.). The Company states that third-party marketers have chosen to devote few, if any, resources to marketing their gas and services to those customers, which may result from limited expectations regarding the profitability of providing gas service to residential and small commercial customers, as well as the relatively high costs of marketing to large numbers of relatively small customers (id. at 64). Thus, the Company's assumption for transportation migration recognizes that the competitive market for this tier of customers may take a number of years to develop (id.).

Tier 2 consists of large and medium-sized C&I customers (Rates G-42, G-43, G-52 and G-53) (id. at 63). The Company indicates that these medium and large-sized C&I customers may be attractive to third-party marketers, depending on their particular circumstances, higher gas use and/or higher load factors. However, customers in Tier 2 with lower load factors may limit this tier's ability to grow much beyond the current transportation migration level of approximately 28 percent (id. at 64).

Finally, Tier 3 consists of extra-large C&I customers (Rates G-44 and G-54) who, in the Company's experience, are the most likely to convert to transportation service (id. at 63). The Company states that the customers of this tier have always presented the most desirable volume and load characteristics to third-party gas marketers, and will continue to do so in the

future (id. at 65). KeySpan states that, for this group, the transportation migration rate is 77 percent. However, this percentage is not expected to increase substantially because most of the customers that would be interested in migrating to transportation have already done so (id.).

KeySpan applied an average of the percentages of transportation migration in each tier between 1999 and 2001 to the total loads expected to occur during the five-year forecast period. The Company then calculated, for each year in the forecast, the volumes of throughput in each tier that will migrate to transportation, deriving the total transportation load (id.).

(B) Impact of Transportation on Resource Plan

The Company states that its resource portfolio is currently structured to have a high level of flexibility to adapt to changing market conditions and regulatory obligations (id.). The Company asserts that it has the flexibility to eliminate up 100 percent of its existing domestic gas commodity purchase contracts in less than a twelve-month period (id.). In addition, KeySpan states that it has contract entitlements to gas from the Canadian provinces, which provide capacity and gas supplies to meet the ongoing needs of sales customers and customers migrating to transportation service under the capacity-assignment program (id. at 66).

KeySpan assigns a pro rata share of pipeline capacity, underground storage capacity and peaking capacity to third-party suppliers on behalf of those sales customers who convert to transportation service (id. at 66). The Company states that it retains recall rights on the capacity contracts that are released to suppliers on behalf of their customers, to ensure that the capacity remains available to serve load within the KeySpan service territory (id.).

The Company states that the customer load participating directly in the transportation program, and thus not eligible for mandatory capacity assignment, is relatively small in

proportion to the Company's overall throughput (id. at 67). However, KeySpan anticipates that the percentage of new load moving directly to transportation could potentially increase, especially among medium and large C&I customers and, therefore, the Company monitors growth in new transportation load (id.). The Company has not adjusted its filing to reflect this trend because there is no experience upon which to base a projection (id. at 67-68). To the extent that the Company projects a need for incremental capacity on the peak day, the Company will consider the trend in these transportation loads as a factor in determining the best way to meet that need (id. at 68).

Regarding the renewal of the Company's capacity contracts, the Company states that it will evaluate the overall need and cost effectiveness of using such capacity to serve all customers, regardless of whether they are firm sales or transportation customers (id.). The Company also plans to negotiate the terms and conditions of any contracts up for renewal, in order to meet end-use requirements of customers and to maintain flexibility to respond to a change in service obligations (id.).

5. Sensitivity Analysis

The Company explains that it performed a sensitivity analysis to consider the inherent uncertainty in demand and sendout forecasts so that it can design an adequate and a reliable resource portfolio to meet customers' needs at the lowest possible cost (id. at 69). Specifically, the Company states that it developed high- and low-demand scenarios relative to a base case forecast scenario to determine the impact of various economic and demographic changes on its resource portfolio (id. at 69 and Chart III-B-12).

a. Development of Demand Scenarios

The Company states that, in developing its demand scenarios, it first identified the key variables, namely, fuel price volatility and economic activity, which are the likely sources of uncertainty in natural gas demand forecasts (id. at 69). Next, the Company developed the high- and low-demand scenarios by creating "a reasonable bandwidth around its base-case demand forecast to account for these uncertainties." (id.).

i. High Demand Scenario

The Company's high demand scenario assumes household growth and employment rates that are 50 percent higher than the base case (id. at 70). Specifically, the high demand scenario assumes that during the forecast period the average growth rate of households will range from 0.8 percent to 1.2 percent (with a mid-point of 1.0 percent), while the average employment growth rate will range from 0.7 percent to 2.2 percent (with a mid-point of 2.0 percent) (id.). The Company further assumes that, during the forecast period, gas and oil prices will remain unchanged relative to the base case (id.). The Company states that the analysis for the high-demand scenario shows that it will need gross incremental load additions of 30,239 BBtu and net incremental load additions of 19,316 BBtu (compared to 24,592 BBtu of gross and 13,292 BBtu of net additions in the base case) over the forecast period (id. at 69, Chart III-B-13 and Chart III-B-5).

ii. Low Demand Scenario

The Company explains that it would normally develop assumptions for the low-demand scenario that are symmetrical with the assumptions for the high-demand scenario, but given the events of September 11, 2001, it decided to incorporate in the low-demand scenario additional

assumptions relating to the possible impact of those events on the economy, for example, by assuming slower economic growth in the early years of the forecast period (id. at 71). The Company states that, for the low demand scenario, it assumed that during the forecast period the annual growth rate of households will drop to between 0.3 percent and 0.4 percent (with a mid-point of 0.36 percent), while the annual growth rate of employment will drop to between 0.0 percent and 0.8 percent (with a mid-point of 0.5 percent), relative to the base case (id. at 71 and Chart III-B-16). In addition, the Company assumed in the low-demand scenario that, relative to the base case, gas commodity prices will be lower in the first year of the forecast period, higher in the middle years of the forecast period, and lower again in the last year of the forecast period (id. at 71-72 and Chart III-B-16). The Company also assumed that oil prices will be lower throughout the forecast period for the low-demand scenario than those reflected in the base case (id.).

The Company states that the analysis for the low-demand scenario shows that it will need gross incremental load additions of 20,900 BBtu and net incremental load additions of 10,363 BBtu (compared to 24,592 BBtu of gross and 13,292 BBtu of net additions in the base case) over the forecast period (id. at 70, Chart III-B-15 and Chart III-B-5). The Company further states that the assumptions of slower economic growth and lower energy prices which it included in the low-demand scenario result in a lower level of gross and net annual load additions of about 4,180 BBtu per year and 2,073 BBtu per year, respectively (id. at 72).

6. Forecast vs. Actual Load Additions

The Company states that the end-use model has not previously been used to forecast load additions in the Colonial Gas and Essex Gas services territories and, therefore, the

Company has compared the past forecast results of the end-use model for the Boston Gas system to actual load addition experience on the Boston Gas system, for the period 1996-2000 in the Boston Gas service territory only (id. at 73-74). The results show the residential projections were five percent lower, C&I sector projections one percent higher, and total projections one percent lower on average than actual realizations (id. at 73). The Company states that these results show minimal forecasting error (id.).

7. Method for Projecting Sendout

The Company established a "baseline sendout requirements" model by regressing daily firm sendout on independent variables such as temperature and day of the week for the most recent split year (id. at 74-75). Next, KeySpan added the incremental sendout for each plan year to the baseline sendout and obtained the forecast of total sendout requirements over the forecast period (id. at 75).

The Company developed a linear regression equation for each of the four geographic areas comprising the KeySpan service territory (id.).[19] The actual daily firm sendout is regressed against: (1) daily EDD data, (2) EDD data lagged by one day, and (3) a weekend dummy variable (id.). The baseline equation data covers May 1, 2000 through April 30, 2001 (id.). The Company indicates that the adjusted R-squared coefficients[20] are in the range of

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19 The four service areas are Boston, Essex, Lowell and Cape Cod.

20 The R-squared coefficient provides a quantitative measure of how well a fitted regression model containing the independent or explanatory variables predicts the dependent variable. In other words, the R-squared coefficient measures the total variation in the dependent variable that is explained by the independent or explanatory variables in a regression model.

0.983 to 0.988, and all of the t-statistics[21] are greater than 2.0, indicating that these variables are significant to the explanatory power of the equation (id. at 76, Chart III-C-1).

KeySpan used monthly independent EDD variables from September through June to model the seasonal change (Exh. KEY-1, at 76). Each monthly variable has a coefficient of zero for all days not in its respective time period and a coefficient of the actual EDD value for the days within its time period (id.). The resulting coefficient is then the heating increment for the given time period (id.). The Company states that the positive signs on the coefficients imply that as EDD increases, the Company's sendout requirements increase as well, which corresponds with the experience of KeySpan (id.).

The Company claims that the inclusion of the one-day lagged EDD variable (i.e., the previous day's EDD) contributes to the explanatory power of the model (id.). The Company states that the positive sign of the coefficient indicates that heating requirements increase as two consecutive days of cold weather cool down structures more than a single day (id. at 76-77). The value of this variable was set to zero for the months of July and August, since there is no heating requirement in the summer (id. at 77).

The weekend dummy variable measures the effect of weekends on daily load (id.). The Company notes that the negative coefficient of this variable shows a load reduction during weekends, all other factors being equal (id.).

The Company states that it combined the 2000-2001 baseline sendout, which was derived from the regression analysis, with the annual incremental sendout forecast to yield the

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[21] The t-statistic is used to test whether an independent or explanatory variable in a regression equation is statistically significant.

forecast of customer requirements under normal weather conditions (id. at 78). The normal firm sendout level for the 2000-2001 split year is at 110,617 BBtu, and for the 2005-2006 split year is at 123,830 BBtu (id.). Further, the Company states that under design-weather conditions, the sendout level for the 2000-2001 split year is at 118,926 BBtu and for the 2005-2006 split year is at 133,361 BBtu (id. at 89).

8. Positions of the Parties

a. Attorney General

The Attorney General states that a 1992 Agreement between Commonwealth Gas Company (d/b/a NSTAR Gas Company) ("NSTAR") and Colonial Gas Company (d/b/a KeySpan Energy Delivery New England) allowed Colonial Gas Company to serve certain customers in the Town of Plymouth on a temporary basis (Attorney General Brief at 3, n.5, citing, KeySpan Energy Delivery New England and NSTAR Gas Company, D.T.E. 02-44 (2002)). The Attorney General notes that KeySpan and NSTAR currently have a petition before the Department requesting permission to transfer these customers to NSTAR. Id.[22]

The Attorney General argues that KeySpan's forecast and supply plan does not incorporate the 1,100 customers that the Company expects to lose in the Cape Cod division during the forecast period as a result of the transfer of these customers to NSTAR (Attorney General Brief at 3, citing Tr. 22). The Attorney General requests the Department to require KeySpan to revise its forecast and supply plan to take into account the loss of the 1,100 customers on the Company's resource requirements (Attorney General Brief at 4).

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[22] The Department approved the petition on September 30, 2002.

b. The Company

KeySpan explains that the loss of the 1,100 customers in the Town of Plymouth would reduce the total design-year sendout requirements by 173,000 MMBtus and the design day requirements by 2,000 MMBtus (Company Reply Brief at 6-7, citing, RR-AG-1). The Company asserts that the loss of this customer load is negligible given the Company's total demand forecast and resource portfolio, and therefore, does not warrant a revision of the filing (Company Reply Brief at 7). The Company explains that even if the loss of this customer load were reflected in its base-case scenario, customer demand would still exceed the demand represented in the low-demand scenario (id.).

KeySpan explains further that the loss associated with the 1,100 customers in the Town of Plymouth will be incorporated into the Company's forecasts as a part of its on-going resource planning process (Company Reply Brief at 7, n.6, citing, Exh., KEY-1, at 33-34, 75-76). The Company states that each spring it upgrades the regression analysis that it used to develop the "Reference Year" sendout in the instant case, to include actual load data from the most recent winter period (id.). These annual updates allow the Company to monitor trends in consumption patterns and load data which are then used in the development of the base, high and low-demand scenarios (id.). The Company, therefore, asks the Department to reject the Attorney General's request for a revised forecast and supply plan (Company Reply Brief at 8).

9. Analysis and Findings

In preparing its demand forecasts, KeySpan used the same end-use modeling methodology approved previously by the Department (See Boston Gas Company, D.P.U. 94-

109 (1996) and Boston Gas Company, D.P.U./D.T.E. 97-81(2000)).[23] KeySpan first, developed separate traditional and non-traditional market forecasts which it then summed to yield the total demand projections; second, it applied its end-use modeling methodology for its traditional customers and estimated the total energy demand by end-use and fuel type; and third, it prepared separate gas consumption estimates for existing and new categories of residential and C&I customers. This method employs traditionally proven techniques previously approved by the Department (See Boston Gas Company, D.P.U./D.T.E. 97-81, at 32-33 (2000)). With regard to the predictive power of its model, the Company employed an ex post analysis which compared actual and forecast gross load additions for the historical five year period of 1996-2000.[24] This analysis indicates that, in the absence of two outlier years, the resulting total forecast load additions deviated from the actual by minus one percentage point. However, the Department directs the Company to test the predictive power of its model over its entire service territory in the next Company Forecast and Supply Plan.

The Department finds that the Company developed a statistically sound methodology to project sendout. This is supported by the strong statistics such as the adjusted R-squared, and the t-statistics for the estimates of the variables. Consequently, the Department finds that the Company's sendout model is appropriate, reviewable and reliable for forecasting the

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[23] In addition, the end-use methodology is widely used in the industry and also by the Energy Information Administration ("EIA") of the Department of Energy to prepare demand forecasts.

[24] The Department notes that the Company has compared only the actual and forecast gross load additions of the former Boston Gas service territory, and not of the entire KeySpan service territory. This is because, prior to this filing, Colonial Gas and Essex Gas used different forecasting methodologies (See Sections II-B and II-D-6 above).

normal-year, design-year and design-day sendout for the residential and C&I classes. The Department, therefore, finds the Company's demand forecasts to be appropriate, reviewable and reliable.

Regarding the Attorney General's request that the Department direct KeySpan to revise its forecast and supply plan to reflect the loss of 1,100 customers, the Department notes that KeySpan provided an analysis showing that even if the loss of the 1,100 customers were accounted for in the Company's base-case scenario, the adjusted base-case scenario would still exceed the demand represented by the low-demand scenario throughout the forecast period (RR-AG-1). Moreover, the difference between the low demand-scenario and the adjusted base-case scenario is negligible relative to the Company's total resource requirement (id.). Thus the Department finds that the loss of this customer load is negligible relative to KeySpan's total resource portfolio and does not warrant the development of a revised forecast. The Department, therefore, rejects the Attorney General's request that the Company revise its forecast and supply plan to reflect the loss of these customers.

With regard to the sensitivity analysis, the Department finds that KeySpan used appropriate and reasonable statistical methods and forecasting techniques to develop its high- and low-demand scenarios. The Department further finds that the economic and demographic data the Company used to develop its demand scenarios over the past twenty years are reliable (See Exh. D.T.E. 1-27). In addition, the Department finds that the economic and price assumptions upon which KeySpan based its demand analysis are reasonable. The Department notes that the full impact of the events of September 11, 2001 on the economy and on energy use will not be known until sufficient data have been collected and analyzed. The Department

therefore finds KeySpan's high- and low-demand scenarios to be reviewable, appropriate and reliable.

In conclusion, the Department finds that KeySpan used appropriate statistical tools and forecasting methodologies to forecast energy demand and sendout during the forecast period. The Department notes that the Company updated the Energy Efficiency Model that Boston Gas used in its previous forecast and supply plan to reflect current assumptions relating to DSM program costs, benefits, and participation, the discount rate, and avoided natural gas costs. See D.P.U./D.T.E. 97-81. The Department therefore finds KeySpan's long-range forecast to be reviewable, appropriate and reliable.

## III. ANALYSIS OF THE SUPPLY PLAN

### A. Standard of Review

The Department is required to ensure "a necessary energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost." G.L. c. 164, § 69I. In fulfilling this mandate, the Department reviews a gas company's supply planning process and the two major aspects of every utility's supply plan -- adequacy and cost.[25] Commonwealth Gas Company, D.P.U. 92-159, at 53 (1995); Colonial Gas Company, D.P.U. 93-13, at 49-50 (1995); 1992 Boston Gas Decision, at 201.

The Department reviews a gas company's five-year supply plan to determine whether the plan is adequate to meet projected normal-year, design-year, design-day, and cold-snap firm

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[25] G.L. c. 164, § 69I also directs the Department to balance cost considerations with environmental impacts in ensuring that the Commonwealth has a necessary supply of energy. Colonial Gas Company, D.P.U. 96-18, at 31; Commonwealth Gas Company, D.P.U. 92-159, at 53; Colonial Gas Company, D.P.U. 93-13 at 50.

sendout requirements. The Department's review of reliability, another necessary element of a gas company's supply plan, is included in the Department's consideration of adequacy. See Fall River Gas, D.T.E. 99-26, at 18 (2000); Colonial Gas Company, D.P.U. 93-13 at 50, n.22; 1992 Boston Gas Decision, 25 DOMSC at 201, n.87. In order to establish adequacy, a gas company must demonstrate that it has an identified set of resources that meet its projected sendout under a reasonable range of contingencies. If a company cannot establish that it has an identified set of resources which meet sendout requirements under a reasonable set of contingencies, the company must then demonstrate that it has an action plan which meets projected sendout in the event that the identified resources will not be available when expected. D.P.U. 96-18, at 31; D.P.U. 92-159, at 54; D.P.U. 93-13, at 50.

In its review of a gas company's supply plan, the Department reviews a company's overall supply planning process. An appropriate supply planning process is essential to the development of an adequate, low-cost, and low environmental impact resource plan. Pursuant to this standard, a gas company must establish that its supply planning process enables it to (1) identify and evaluate a full range of supply options, and (2) compare all options -- including Conservation and Load Management ("C&LM") -- on an equal footing. Colonial Gas Company, D.P.U. 96-18, at 31; Commonwealth Gas Company, D.P.U. 92-159, at 54; Colonial Gas Company, D.P.U. 93-13, at 51; 1992 Boston Gas Decision at 202.

Finally, the Department reviews whether a gas company's five-year supply plan minimizes cost. A least-cost supply plan is one that minimizes costs subject to trade-offs with adequacy and environmental impact. Commonwealth Gas Company, D.P.U. 92-159, at 55; Colonial Gas Company, D.P.U. 93-13, at 51-52; 1992 Boston Gas Decision at 203. Here, a

gas company must establish that application of its supply planning process has resulted in the addition of resource options that contribute to a least-cost plan.

B. Supply Plan Resources

The Company has identified a resource portfolio that is available to meet forecasted firm sendout requirements under various demand scenarios, including the base case scenario, identified by the Company as the most probable demand case (Exh. KEY-1, at 119; Tr. at 137; Company Brief at 35). This portfolio is identified as base case supply plan resources. As defined by the Company, base case refers to economic conditions, not weather conditions; however, the Company presented its cold-snap analysis separately from its base case analysis of the supply plan under normal year, design year, and design day weather conditions (Exh. KEY-1, at 119-127; Tr. at 136). Adequacy of resources under high- and low-demand growth were evaluated by the Company as a sensitivity analysis, supplemental to its analysis of base case supply plan resources (Exh. KEY-1, at 37, 69, 119-126).

1. Gas Commodity

The Company indicated that it has several contracts which include the rights to gas commodity bundled with transportation capacity. These contracts, listed in Attachment A, are for Canadian gas. KeySpan indicated that its domestic gas commodity purchase contracts are for less than 12-month periods (id. at 114). KeySpan stated that El Paso Merchant Energy is to provide up to 535 BBtu/day of city-gate delivered supplies, and that KeySpan would obtain any required additional supplies through market-area purchases and short-term supply arrangements (id. at 114-115). The contract with El Paso Merchant Energy terminates on October 31, 2002

(Exh. DTE 3-10).[26] In addition to these domestic and Canadian supply contracts, KeySpan stated that is negotiating contracts with Distrigas which include delivery of natural gas (Exh. KEY-1, at 110).

2. Gas Transportation Services

a. Company's Proposal

KeySpan indicated that it has multiple contracts for firm pipeline service. These contracts are listed in Attachment B. The Company indicated that its "evergreen" contracts with Tennessee Gas Pipeline Company ("Tennessee") have a termination date of 2003, with a provision for year-to-year extension until one of the parties gives notice of termination (id. at 103-106; Exh. DOER 1-54). KeySpan stated that it is discussing renewal of these evergreen contracts with Tennessee, and that its analysis shows these resources are still necessary to provide reliable service (Exh. DTE 3-5; Tr. 114-115). In addition to the tabulated contracts listed in Attachment B, KeySpan expects that 35,000 BBtu/day of capacity on the Tennessee pipeline, previously released by KeySpan to Enron, will be returned to KeySpan (Tr. at 73-74, 84-86). The Company has an agreement with Algonquin for gas delivery service on KeySpan's proposed HubLine transmission project. Because gas delivery by Algonquin via the HubLine is not possible until that project is completed, KeySpan has entered into an interim agreement with Algonquin for 10 BBtu/day until the HubLine agreement can be implemented (Exh. KEY-1, at 26-27; DOER 1-59; Tr. at 58, 61, 76, 77). KeySpan indicated that it is seeking another 3.2 MMBBtu/day of capacity from Algonquin, to serve the increasing

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[26] KeySpan has entered into a short-term (less than 365 days) agreement with Entergy-Koch to replace the arrangement with El Paso Merchant Energy.

demand in the Cape Cod area (Tr. at 61-62, 76, 77). The Company indicated that it also has contracts to transport liquid natural gas by truck from the Distrigas facility in Everett to various points on the Company's system (Exh. DTE 3-1).

b. Positions of the Parties

i. Attorney General

The Attorney General indicates that as of the date of the hearing, the Company had not yet been notified whether or not the 35 BBtus of Enron capacity would be returned and if it is returned whether the Company would seek to dispose of the whole segment or incorporate it into the Company's portfolio (Attorney General Brief, at 5). The Attorney General contends that given the potential for the costs of excess capacity to be passed on to default customers, the Department should require the Company to provide an assessment of the level of excess capacity the Company anticipates having during the forecast period along with the cost of the excess capacity and how it plans to mitigate these costs (id.).

In addition, the Attorney General asserts that dispatch of the HubLine when the load factor for HubLine is less than seven percent is more expensive for consumers than the purchase of additional liquified natural gas ("LNG") (Attorney General Brief at 4). The Attorney General states that, on a normal year basis, the HubLine will be dispatched at an average load factor of four and a half percent (id.). On this basis, the Attorney General asserts that the Company's supply plan does not reflect an economic use of the HubLine (id.). The Attorney General also challenges the economics of using the HubLine should the Company's use approach a 100 percent load factor (id. at 4-5). The Attorney General maintains that other contracted resources would not be fully utilized under these circumstances, which the Attorney

General characterizes as a contracting excess (id. at 5). Thus, the Attorney General contends that the Company has contracted for too much capacity, burdening its customers (id.).

ii. Company

The Company asserts that the Enron capacity is related to a negotiated assignment of long-haul transportation capacity to Enron Capital and Trade Resource Corp. as part of the contract restructuring with Imperial Resources, Inc. According to the Company, that assignment was approved by the Department in Boston Gas Company, D.P.U. 97-104 (KeySpan Reply Brief, at 15). The Company states that it notified the Department, at the hearing, the capacity was being returned to the Company as a result of the Enron bankruptcy (id.). The Company further indicated, at the hearing, that it is evaluating options for deriving the maximum level of value from these resources (id.). The Company states that its options for this capacity are: (1) to retain the capacity to substitute for other resources that are up for renewal; (2) to release the capacity to the marketplace; or (3) a combination of the two (id.). The Company contends that given that the Company's supply plan identifies a need for incremental resources in the later years of the forecast period, as well as the fact that a number of contracts are up for renewal by the end of 2002, retaining the capacity in the resource portfolio could be a cost-effective resource option (id. at 15-16). The Company also believes that the capacity will have a positive value in the open market, and therefore, the Company may consider a long-term release for two to three years and then incorporate the capacity into the resource portfolio when needed in the later years of the forecast (Company Reply Brief at 16). The Company concludes that it will evaluate its options to ensure that, if retained, the

resource represents a least-cost alternative that meets the Company's needs or, if released, that the release maximizes the value for its customers (id.).

Regarding the Hubline capacity decisions, the Company states that the HubLine agreements were approved by the Department on the basis that (1) the volumes were needed on a design-day and design-season basis and (2) the HubLine contract's cost and associated non-cost factors compared favorably to alternatives (id. at 11). The Company contends that the Attorney General's analysis is flawed because it fails to account for all costs of the LNG alternative, including construction of additional LNG vaporization or pipeline capacity, and it fails to spread the demand charge for LNG over a comparable delivery volume (id. at 12). The Company argues that the alternative of purchasing LNG would involve roughly five or six truck deliveries per day in the winter season, an amount it characterizes as inordinate (id. at 13). With respect to the Attorney General's contention that operating at a high load factor would also be uneconomic, the Company argues that it will have the opportunity to re-optimize its portfolio when existing contracts expire.

c. Analysis and Findings

Regarding the capacity previously assigned to Enron and being returned to KeySpan, the Department notes that the Company has provided an array of options available to it concerning this capacity. The Department directs the Company to submit a status report on the returned capacity by April 1, 2003 to keep the Department informed. The Department will not address the Attorney General's arguments regarding the Hubline contracts because KeySpan's agreements with Algonquin Hubline were previously reviewed and approved by the Department in D.T.E. 02-18 (2002). We note that planning for capacity and commodity is a

fluid process which, as suggested by KeySpan, is subject to continuous re-optimization. The Company's decisions on those matters can be reviewed in the next forecast and supply plan filing.

3. Gas Storage Services

KeySpan indicates that it has contracts for gas storage and contracts for peaking service (Exh. KEY-1, at 106-110). Gas storage contracts are listed in Attachment C hereto. KeySpan indicates that Distrigas was subject to a force majeure situation from September 28, 2001, to November 29, 2001 (id. at 110-111). The Company states that contracts between KeySpan and Distrigas expired on October 31, 2001, and that negotiations for a new contract were delayed as a result of the force majeure (id.). The Company states that it anticipates contract negotiations will resume (id.). The Company further states that it considered the unavailability of Distrigas supplies in its contingency analysis (id.).

4. KeySpan Peaking Facilities

The Company did not account for demand-side management programs in the supply plan section of its forecast and supply plan, but incorporated such programs in its estimate of gas demand (id. at 122). KeySpan indicates that it has local facilities which store liquid natural gas and liquid propane, and that it uses this storage to meet short-term peaks in gas demand (id. at 111). The Company's local storage facilities are listed in Attachment D hereto.

5. Total Design Day Deliverability

In its petition, the Company indicated that its design day deliverability, including upstream and on-system peaking resources, is 1,191 BBtus (id. at 10). The Company also indicated that its design day deliverability increases from 1,200 BBtus in 2001-2002 to

1,235 Bbtus for split years 2003-2004, 2004-2005, and 2005-2006 (Exh. RR-DOER-1). However, the Company also suggested that the actual total design day deliverability is closer to 1,187,644 MMBtus, noting that the higher figures are based on nameplate ratings rather than anticipated function (id.).

C. Adequacy of the Supply Plan

In reviewing the adequacy of a gas company's five-year supply plan, the Department first examines whether the Company's base-case resource plan is adequate to meet its projected normal-year, design-year, design-day, and cold-snap firm sendout requirements and, if so, whether the Company's plan is adequate to meet its sendout requirements if certain supplies become unavailable. D.P.U. 93-13, at 62; 25 DOMSC 116, at 212-213. If the supply plan is not adequate under the base-case resource plan, or not adequate under the contingency of existing or new supplies becoming available, then the Company must establish that it has an action plan which will ensure that supplies will be obtained to meet its projected firm sendout requirements. Id.

1. Normal and Design Year Adequacy

a. Description

KeySpan submitted its supply plans for meeting its forecasted normal year and design year sendout requirements throughout the forecast period (Exh. KEY-1, Tables G-22N(revised), G-22D(revised)). KeySpan explained that it plans to meet its normal year and design year heating season needs by using a combination of several existing supply, underground storage, LNG, propane, and interstate pipeline contracts (id. at 93). KeySpan forecasts that normal year firm sendout requirements for the base case will increase from

84,979 BBtu in the 2001-2002 heating season to 95,359 BBtu in the 2005-2006 heating season. KeySpan forecasts that design year firm sendout requirements for the base case will increase from 92,287 BBtu in the 2001-2002 heating season to 104,028 BBtu in the 2005-2006 heating season (id., Table G22N(revised), G22D(revised).

b. Analysis and Findings

As noted previously, the Department has found KeySpan's normal year forecast to be reviewable, reliable, and appropriate. The Department also found the Company's design year to be reviewable, appropriate, and reliable. Based on KeySpan's sendout and supply tables, the Company has demonstrated that it has adequate supplies through various sources to meet its forecast sendout requirements under normal and design year throughout the forecast period. Accordingly, the Department finds that KeySpan has established that the Company has adequate supplies to meet its normal year and design year forecast sendout requirements throughout the forecast period.

2. Design Day Adequacy

a. Description

The Company explains that it has adequate capacity to serve the design day requirements throughout the forecast period (id., Vol. I, at 126). KeySpan plans to meet its design day needs through existing firm pipeline supplies, underground storage, LNG, and propane injections (id. at 93). KeySpan forecasts that design day firm sendout requirements will increase from 1,155 BBtu in the 2001-2002 heating season, to 1,309 MMBtu in the 2005-2006 heating season (id., Vol. I, Table G-23D).

b. Positions of the Parties

i. Attorney General

The Attorney General argues that the Company has failed to meet design day requirements. The Attorney General notes that the delay of the in-service date for the Algonquin HubLine project will create a need to acquire incremental capacity specifically for the Colonial Cape Cod division (Attorney General Brief, at 2). The Attorney General also notes that the Company presented a contingency analysis showing resources and requirements assuming a one year delay in the HubLine in-service date (Attorney General Brief, at 3). The Attorney General contends that the delay case shows that the Company is relying on propane to serve the deficiency created by the delay, even though only Boston Gas and Colonial-Lowell dispatch propane on the design day (id.). The Attorney General states that the Company will be short on the Cape by 3,000 MMBtus/day if design day conditions occur this winter and that the Company is attempting to increase the volumes available through an interim contract with Algonquin (id.). The Attorney General contends that until that agreement or another alternative is in place, the Company has a deficiency in the Colonial-Cape service area (id.).

The Attorney General concludes that the Department should not approve the Company's plan (Attorney General Brief, at 3). The Attorney General maintains that the record establishes that there is the imminent potential for the occurrence of a design day deficiency in the near future. The Attorney General requests that the Department order KeySpan to resolve the deficiency immediately and re-file all documents showing a resolution that will result in the most reliable and least-cost service to customers (id.).

ii. Division of Energy Resources

DOER argues that Keyspan should address its imminent capacity shortfall in the Cape Cod Division (DOER Brief, at 3). DOER argues that the Company will rely on other purchased resources if the Company does not have sufficient capacity under design conditions (id.). DOER maintains that KeySpan can not simply rely on these other resources because of limitations on the reliability of the resource and the lack of back-up capacity to ensure deliveries (id.). DOER, therefore, contends that the Company's resource portfolio should have sufficient capacity entitlements to meet design day sendout requirements (id.).

DOER asserts that the supply plan base case relies upon Algonquin's HubLine capacity being in service by November 1, 2002 to fill the Colonial Gas Cape Cod Division's incremental need for 13,196 MMBtus on the design day of 2002-2003 (DOER Brief, at 3). DOER maintains that the Company acknowledged, during the adjudicatory hearing, that the delay of the in-service date for HubLine (from Nov. 1, 2002 to sometime in 2003) would result in a design day capacity shortfall, requiring the Company to procure an additional 3,000 MMBtus/day for its Cape Cod Division for the 2002-2003 winter. DOER notes that KeySpan described the possibility of increasing its interim contract with Algonquin form 10,000 MMBtus/day to 13,196 MMBtus/day for the coming winter season to provide additional capacity, but that contract has not been executed (id.). DOER requests that the Department require KeySpan to address this shortage and to file its proposed remedy with the Department on or before December 1, 2002 (id.).

DOER further argues that KeySpan should be required to conduct a refined sendout capability analysis that would be based on the Company's primary divisions and upstream

pipeline capacity (DOER Brief at 2, 6).[27] DOER contends that, by conflating local demand and supply balances into a Company-wide analysis, the Company's forecast and supply plan cannot demonstrate that the Company has contrived sufficient resources to meet sendout requirements in all of its outspread service districts (id. at 4-5). Specifically, DOER suggests that the Company has not considered location-specific resource contracts in its analysis (id. at 5). DOER points out that a demonstration showing that total resources match total requirements does not necessarily show an ability to deliver gas to all areas and divisions of its distribution system at the required volume and pressure (id. at 4-5).

DOER maintains that the record in the case demonstrates that KeySpan's methodology for projecting sendout capacity is flawed (DOER Reply Brief at 1). Specifically, DOER states that KeySpan has acknowledged that it failed to identify a need for additional incremental peak-day resources for the winter of 2002-2003 (id. at 1).[28] DOER also notes that KeySpan performed a refined sendout capability analysis for another case and that analysis showed a

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[27] DOER cited the approach employed by KeySpan in preparing exhibit TEP-3 in D.T.E. 02-18 as an example of conducting a refined analysis. That exhibit subdivides the Company's peak day resources and requirements among KeySpan's three constituent companies – Boston Gas, Essex Gas, and Colonial Gas – and further divides resources and requirements into the section of each company's service territory considered to be served by Tennessee or by Algonquin (i.e., "Tennessee-side" and "Algonquin-side") (Exh. AG 2-4 (att.)).

[28] DOER cites pages of the hearing transcript and KeySpan's initial brief in arguing that the Company acknowledged that it failed to identify additional need for 2002-2003 (DOER Reply Brief at 1). In the evidentiary hearing, the Company stated that its forecast for year 2002-2003 incremental peak-day need is larger than the amount for which it had contracted supply (Tr. at 61).

need for incremental resources that was not shown by the Company's analysis in the present case as presented in Table G-23D (Revised) of the forecast and supply plan (DOER Brief at 4).[29] Consequently, DOER notes the Company's position that it will need to obtain additional capacity during the forecast period (DOER Reply Brief at 1). DOER maintains that the Company's forecast is too general and may overlook specific deficiencies exemplified by a lack of sufficient capacity for the Cape Cod district (DOER Brief at 3; DOER Reply Brief at 2).

iii. The Company

The Company contends that it has demonstrated that the supply plan meets the Department's standard on the adequacy of the resource plan because it has provided the Department with an "action plan" to resolve the projected design day need of 13, 196 MMBtu/day in the Cape Cod service territory during the 2002-2003 heating season (Company Reply Brief, at 8). The Company states that the Department has approved an agreement between KeySpan and Algonquin to provide up to 10,000 MMBtus/day of transportation capacity to the Cape Cod service area until the commencement of the HubLine project (DTE 02-18) (KeySpan Reply Brief, at 9). The Company further asserts that it stated its intention to contract for the approximately 3,000 MMBtus/day of additional capacity for the 2002-2003

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[29] DOER refers to D.T.E. 02-18, which was a petition of KeySpan Energy Delivery New England for approval of Firm Gas Transportation Agreements with Algonquin Gas Transmission Company. Exhibit TEP-3 in DTE 02-18 showed that firm sendout requirements exceeded total deliverability on the Algonquin side of the Colonial Gas system, leaving design day incremental peak requirements for the Algonquin side of Colonial Gas of 9,269 MMBtu in 2001-2002, increasing to 23,242 MMBtu in 2005-2006 (Exh. AG 2-4 (att.)). Table G-23D (Revised) of the forecast and supply plan does not subdivide the Company's peak day resources and requirements on the basis of the Company's service territories; nor does it compare resources to requirements (Exh. DTE 2-40 (att.)).

heating season in the Cape Cod service area and that it was engaged in negotiations with Algonquin to accomplish that objective (id.).[30]

The Company agrees with DOER that there is a need to evaluate delivery capabilities at actual supply points (Company Reply Brief at 6). However, the Company argues that the Department does not require this information (id. at 7). Nevertheless, for its next forecast and supply plan proceeding, the Company proposes to provide an exhibit that indicates the areas on the KeySpan system that will require the addition of design-day delivery capability during the forecast period (id. at 6).

c. Analysis and Findings

As noted previously, the Department found the Company's design day forecast to be reviewable, appropriate, and reliable. Based on this finding and the sendout and supply tables, the Department finds that KeySpan has demonstrated that it has adequate supplies and facilities

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30 On November 8, 2002, after the close of the evidentiary hearing, KeySpan filed with the Department a copy of a new service agreement (Service Agreement 510056) between Algonquin and the Company, which provides the Company with additional transportation capacity of up to 3,200 MMBBtu/day from the KeySpan city gate at Ponkapoag to the KeySpan city gates at Sagamore and Bourne. The service agreement was executed on October 29, 2002 and will terminate on November 1, 2003.

Service Agreement 510056 was not in existence at the time of the evidentiary hearing, and thus could not have been filed before the hearing concluded. The agreement is directly relevant to an issue raised by the parties regarding adequacy of supply, and no party objected to KeySpan's request that it be included in the record. Accordingly, pursuant to 220 C.M.R. 1.11 (7), the following documents are entered into the record as exhibits: 1) Service Agreement 510056; 2) the accompanying cover letter from KeySpan counsel, dated November 8, 2002; and 3) the accompanying letter from Elizabeth Danehy of KeySpan to William Yardley of Duke Energy Gas Transmission. These three documents will treated be marked as one exhibit, KEY-2, and the Final Exhibit List will be revised to reflect the inclusion of this Exhibit in the record.

to meet forecast sendout requirements under the design day conditions throughout the forecast period. In addition, the Company has submitted a contract with Algonquin to meet the 3,000 MMBtus/day of supply needed for the Cape Cod area thus rendering the Attorney General's and DOER's concerns moot.

Finally, regarding DOER's proposal to evaluate deliverability at actual supply points, we note that the standard for reviewing forecast and supply plans was developed at a time when there were ten investor owned Local Distribution Companies ("LDCs") and only two pipelines delivering gas into Massachusetts. Since that time the number of pipelines has increased and LDCs have expanded their distribution systems and acquired new customers. In addition, mergers and acquisitions have led companies like KeySpan to encompass distinct and non-contiguous service territories that due to their location cannot necessarily be served by the same interstate pipeline. Consequently, DOER's proposal appears to be valid. In addition, KeySpan has proposed to provide an exhibit that indicates the areas on the Company's system that will require the addition of design-day delivery capability during the forecast period. The Department, therefore, directs the Company to provide in its next forecast and supply plan a proposal for meeting design weather requirements in each of these areas.

3. Cold-Snap Adequacy

a. Description

KeySpan generated a 14-day cold-snap scenario during the actual coldest period in the last two weeks of February using 669 EDD (id. at 127). The Company noted that a one-in-50-year occurrence for a cold-snap would be 626 EDD (id.). KeySpan explained that the Company's portfolio can meet the cold-snap requirement in all the years of the forecast (id.).

The Company's filing demonstrated that its existing supply resources could satisfy such a contingency (id., Table G-22N).

b. Analysis and Findings

Based on the Company's analysis, the Department finds that KeySpan has demonstrated that it has adequate supplies to meet its firm sendout requirements during a prolonged cold-snap.

4. Conclusions on the Adequacy of the Supply Plan

The Department finds that: (1) the normal year and design year supply plans are adequate to meet the Company's forecasted sendout requirements throughout the forecast period; (2) the Company has demonstrated that it has adequate supplies to meet forecasted sendout requirements under design day conditions throughout the forecast period; and (3) the Company has demonstrated that it has adequate supplies to meet its firm sendout requirements during a prolonged cold-snap. Based on these subsidiary findings, the Department finds that KeySpan has identified adequate resources to meet its firm sendout requirements throughout the forecast period.

D. Supply Planning Process

1. Standard of Review

The Department has determined that a supply planning process is critical in enabling a utility company to formulate a resource plan that achieves an adequate, least-cost and low environmental impact supply for its customers. Berkshire Gas Company, D.P.U. 94-14, at 36 (1994); Colonial Gas Company, D.P.U. 93-13, at 70 (1995); 1992 Boston Gas Decision, at 223; Boston Gas Company, 19 DOMSC 332, at 388 (1990) ("1990 Boston Gas Decision").

The Department has noted that an appropriate supply planning process provides a gas company with an organized method of analyzing options, making decisions, and reevaluating decisions in light of changed circumstances. D.P.U. 94-14, at 36; D.P.U. 93-13, at 70; 1992 Boston Gas Decision, at 223; 1990 Boston Gas Decision, at 388. For the Department to determine that a gas company's supply planning process is appropriate, the process must be fully documented. D.P.U. 93-13, at 70; 1992 Boston Gas Decision at 223.

The Department's review of a gas company's process for identifying and evaluating resources focuses on whether the company: (1) has a process for compiling a comprehensive array of resource options -- including pipeline supplies, supplemental supplies, DSM, and other resources; (2) has established appropriate criteria for screening and comparing resources within a particular supply category; (3) has a mechanism in place for comparing all resources, including DSM, on an equal basis, i.e., across resource categories, and; (4) has a process that as a whole enables the company to achieve an adequate, least-cost, and low environmental impact supply plan. Fitchburg Gas and Electric Light Company, D.P.U. 94-140, at 37 (1996); Colonial Gas Company, D.P.U. 93-13, at 70 (1995); 1992 Boston Gas Decision at 224; 1990 Boston Gas Decision at 54-55.

The Department reviews a gas company's five-year supply plan to determine whether it minimizes cost, subject to trade-offs with adequacy and environmental impact. Fitchburg Gas and Electric Light Company, D.P.U. 94-140, at 37 (1996); D.P.U. 93-13, at 88; 1992 Boston Gas Decision, at 236; 1987 Boston Gas Decision, at 214. A gas company must establish that the application of its supply planning process, including adequate consideration of DSM and consideration of all resource options on an equal basis, has resulted in the addition of resource

options that contribute to a least-cost supply plan. D.P.U. 94-140, at 37; D.P.U. 93-13, at 83; 1992 Boston Gas Decision at 233; Berkshire Gas Company, 14 DOMSC 107, at 115 (1986). As part of this review, the Department requires gas companies to show, at a minimum, that they have completed comprehensive cost studies comparing the costs of a reasonable range of practical supply alternatives prior to selection of major new resources for their supply plans. D.P.U. 94-140, at 37; D.P.U. 93-13, at 89; 1992 Boston Gas Decision at 236; 1986 Gas Generic Order, at 100-102.

2. Identification and Evaluation of Resource Options

Previously, the Department has endorsed local distribution company acquisition processes that involved the solicitation of competitive bids from alternative suppliers. Fall River Gas Company, D.T.E. 99-26, at 30 (2000); Colonial Gas Company, D.T.E. 98-90, at 35 (1996); Holyoke Gas and Electric Department, D.P.U. 93-191, at 30 (1996). In the current proceeding, the Department finds that the request-for proposal ("RFP") process used by KeySpan to identify alternative suppliers is appropriate. KeySpan, through its Gas Resource Planning Guidelines, applies price and non-price criteria to determine which options to pursue, and considers both short-term and long-term options. Accordingly, the Department finds that KeySpan has formulated an appropriate process for identifying a comprehensive array of supply options, and has developed appropriate criteria for screening and comparing supply resources.

a. Positions of the Parties

i. Division of Energy Resources

DOER argues that KeySpan's practice to extend, terminate, renegotiate and/or substantively revise a number of long-term transportation contracts without submitting them to the Department for review is in conflict with G.L. c. 164, § 94A (DOER Brief at 8). In particular, DOER asserts that a forecast and supply plan submitted under G.L. c. 164, § 69I does not provide for Department analysis under the public interest standard (id. at 9). Finally, DOER argues that G.L. c. 164, § 94A does not provide an exception for review of long-term contracts, as inferred by the Company (id. at 9.).

ii. The Company

The Company asserts that requiring a second review under Section 94A for contracts subject to substantially similar review in a forecast and supply plan proceeding is unnecessary and would impose substantial administrative burdens on the Company, as well as the Department(Company Reply Brief at 16).

iii. Analysis and Findings

The Department notes that, historically, forecast and supply plans have been reviewed in order to ensure that a gas distribution company has plans to efficiently provide service to the customers in its distribution system. Commodity or capacity contracts are submitted to the Department for review under G.L. c.164, §94A to ensure that (1) they are consistent with public interest and (2) consistent with the Company's most recently approved forecast and supply plan. A forecast and supply plan filing in no way renders G.L. 164, § 94A reviews unnecessary. Therefore, the Department directs KeySpan to file for Department review and approval any portfolio changes or contracts that have a length of a year or more.

3. Consideration of All Resources on an Equal Basis

a. Description

In order to compare DSM resources on an equal footing with supply side resources, KeySpan states that the Company will utilize a spreadsheet developed within the Energy Efficiency Model to project the future impact of DSM programs (id. at 61). The Company states that the Energy Efficiency Model will track costs and benefits relating to energy efficiency and market transformation programs. In addition, KeySpan updated the Energy Efficience Model to reflect current assumptions relating to program costs and benefits, program participation, the discount rate, and avoided natural gas costs (id. at 61).

b. Analysis and Findings

The Department has held that for a gas company's planning process to minimize cost, that process must adequately consider alternative resource additions, including DSM options, on an equal basis. D.P.U. 93-13, at 83; 25 DOMSC 116, at 233. The record shows that the Company intends to evaluate resources within a single resource group, and will evaluate options across resource groups using industry-accepted standards. Accordingly, the Department finds that KeySpan has incorporated both supply-side and demand-side options in its resource mix.

4. Conclusions on the Supply Planning Process

The Department finds that KeySpan has established that its normal year, design year and design day supply plans are adequate to meet the Company's forecast sendout requirements throughout the forecast period. The Department has also found that KeySpan has: (1) formulated an appropriate process to identify a comprehensive array of supply options, and has

developed appropriate criteria for screening and comparing supply resources; (2) addressed the need to analyze an appropriate process for identifying a comprehensive array of DSM options ; and (3) addressed the need to incorporate both supply-side and demand-side options in its resource mix and, in doing so, states that it will compare all resources, including DSM, on an equal basis. Consequently, the Department finds that KeySpan has developed an appropriate supply planning process.

E. Conclusions on the Supply Plan

The Department has found that KeySpan has established that its normal year, design year, design day and cold-snap supply plans are adequate to meet the Company's forecast sendout requirements throughout the forecast period. In addition, the Department has found that KeySpan has: (1) developed appropriate criteria for screening and comparing supply-side resources, and (2) addressed the need for a mechanism to undertake the comparison of resources on an equal basis. Finally, the Department has found that the Company's supply planning process as a whole may lead to the addition of resources that contribute to a least-cost supply plan. Accordingly, the Department approves the Company's supply plan for the years 2001-2002 through 2005-2006.

## IV. CONCLUSION

In conclusion, the Department finds that KeySpan: (1) formulated an appropriate process for identifying a comprehensive array of supply options and has developed appropriate criteria for screening and comparing supply resources; (2) has formulated an appropriate process for identifying a comprehensive array of demand-side management (“DSM”) programs, and has developed appropriate criteria for screening and comparing DSM resources, (3)

incorporated both supply-side and demand-side options in its resource mix; (4) possessed a distribution system that is reasonably adequate to meet customers' needs during the forecast period; and (5) developed a reasonable contingency plan to provide a reliable service to customers during the forecast period. Accordingly, the Department finds that the Company has an appropriate supply planning process, and that the Company's supply plan is reviewable, appropriate, and reliable.

## V. ORDER

Accordingly, after due notice, hearing and consideration, it is

ORDERED: That KeySpan Energy Delivery New England's petition for approval of its long-range forecast and supply plan be and hereby is APPROVED; and it is

FURTHER ORDERED: That KeySpan Energy Delivery New England comply with all of the directives contained herein; and it is

FURTHER ORDERED: That KeySpan Energy Delivery New England shall file its next long-range forecast and supply plan with the Department by March 1, 2005.

By Order of the Department,

_____
Paul B. Vasington, Chairman

_____
James Connelly, Commissioner

_____
W. Robert Keating, Commissioner

_____
Eugene J. Sullivan, Jr., Commissioner

_____
Deirdre K. Manning, Commissioner

Appeal as to matters of law from any final decision, order or ruling of the Commission may be taken to the Supreme Judicial Court by an aggrieved party in interest by the filing of a written petition praying that the Order of the Commission be modified or set aside in whole or in part.

Such petition for appeal shall be filed with the Secretary of the Commission within twenty days after the date of service of the decision, order or ruling of the Commission, or within such time as the Commission may allow upon request filed prior to the expiration of twenty days after the date of service of said decision, order or ruling. Within ten days after such petition has been filed, the appealing party shall enter the appeal in the Supreme Judicial Court sitting in Suffolk County by filing a copy thereof with the Clerk of said Court. (Sec. 5, Chapter 25, G.L. Ter. Ed., as most recently amended by Chapter 485 of the Acts of 1971).

**ATTACHMENT A**. Keyspan Energy Delivery of New England ("KeySpan") Gas Commodity **Contracts**

| Location of Gas Production Fields | Maximum Daily Quantity (BBtu) | Annual Contract Quantity (BBtu) | Contract Modification Date (if any) | Contract Termination Date |
|---|---|---|---|---|
| **Alberta Northeast, Ltd.** | | | | |
| Western Canada | 8.6 | 3139 | -- | 10/31/06 |
| Western Canada | 2.0 | 730 | – | 10/31/06 |
| Western Canada | 6.0 | 2190 | -- | 10/31/06 |
| **Boundary Gas, Inc.** | | | | |
| Western Canada | 1.621 | 591.7 | -- | 1/14/03 |
| Western Canada | 10.533 | 3844.5 | -- | 1/14/03 |
| **Imperial Oil Resources** | | | | |
| Eastern Canada | 43.2 | 15,768 | -- | 3/31/07 |

(Exh. KEY-1, at 108-115; DTE 3-10; Tr. at 111-113)

**ATTACHMENT B: KeySpan Contracts for Firm Tariff Service by Pipeline**

| Contractual Collection Point | Contractual Delivery Point | Maximum Daily Quantity (BBtu) | Annual Contract Quantity (BBtu) | Contract Modification Date (if any) | Contract Termination Date |
|---|---|---|---|---|---|
| **Algonquin Gas Transmission Company** [1] | | | | | |
| Lambertville NJ | KeySpan city gates | 95.594 | NA | 11/01/05 | 10/31/06 |
| Lambertville NJ | KeySpan city gates | 44.699 | NA | 11/01/05 | 10/31/06 |
| Lambertville NJ | KeySpan city gates | 29.909 | NA | 11/01/05 | 10/31/06 |
| Lambertville and Centerville NJ | KeySpan city gates | 27.729 | NA | -- | 10/31/09 |
| Lambertville NJ | KeySpan city gates | 20.771 | NA | 11/01/05 | 10/31/06 |
| Mendon MA | KeySpan city gates | 19.970 | NA | – | 10/31/12 |
| Providence RI | KeySpan city gates | 35.000 | NA | -- | 10/31/07 |
| Lambertville NJ | KeySpan city gates | 18.177 | NA | -- | 10/31/06 |
| Lambertville NJ | KeySpan city gates | 29.909 | NA | -- | 10/31/05 |
| Lambertville NJ | KeySpan city gates | 16.463 | NA | -- | 10/31/12 |
| Mendon MA | KeySpan city gates | 4.000 | NA | -- | 10/31/13 |
| Lambertville NJ | KeySpan city gates | 2.222 | NA | -- | 10/31/12 |
| Lambertville NJ | KeySpan city gates | 4.001 | NA | -- | 10/31/12 |
| Lambertville NJ | KeySpan city gates | 7.327 | NA | -- | 10/31/05 |
| Lambertville NJ | KeySpan city gates | 2.528 | NA | -- | 10/31/12 |

| | | | | | |
|---|---|---|---|---|---|
| Lambertville NJ | KeySpan city gates | 7.918 | NA | -- | 10/31/12 |
| Mendon MA | KeySpan city gates | 2.000 | NA | -- | 10/31/05 |
| KeySpan city gates | KeySpan city gates | 10.000 | NA | – | HubLine inservice date or 10/31/11 |
| Beverly MA (Hubline) | KeySpan city gates | 35.000 (effective 11/1/02) | NA | 11/01/03 (increases to 45 BBtu/day) | 10/31/11 |
| **Texas Gas Transmission Corporation** | | | | | |
| Louisiana | Lebanon OH | 13.280 | NA | -- | 10/31/05 |
| **Transcontinental Gas Pipeline** | | | | | |
| Wharton PA | Centerville NJ | 6.335 | NA | -- | 5/31/08 |
| Wharton PA | Centerville NJ | 0.577 | NA | -- | 5/31/08 |
| **Dominion Gas Transmission** | | | | | |
| Ohio/PA/WV | Oakford/Leidy PA | 21.394 | NA | -- | 3/31/03 |
| Oakford PA | Leidy PA | 1.951 | NA | -- | 10/31/02 |
| Chambersburg PA | Chambersburg/ Oakford PA | 1.887 | NA | 11/01/02 (increases to 2.222 BBtu/d) | 3/31/12 |
| **Texas Eastern Transmission Company** | | | | | |
| Oakford PA | Lambertville NJ | 29.915 | NA | 11/01/05 | 10/31/06 |
| Texas/Louisiana | Lambertville NJ | 39.624 | NA | 11/01/05 | 10/31/06 |
| Texas/Louisiana | Lambertville NJ | 48.133 | NA | 11/01/05 | 10/31/06 |
| Texas/Louisiana | Lambertville NJ | 32.616 | NA | 11/01/05 | 10/31/06 |
| Leidy PA | Lambertville NJ | 21.394 | NA | -- | 4/30/12 |
| Texas/Louisiana | Oakford PA | 5.033 | NA | -- | 10/31/02 |
| Oakford PA | Lambertville NJ | 3.016 | NA | *(prior mod.)* | 4/15/05 |
| Oakford PA | Lambertville NJ | 0.985 | NA | -- | 3/31/06 |

| | | | | | |
|---|---|---|---|---|---|
| Oakford PA | Lambertville NJ | 2.326 | NA | -- | 10/31/12 |
| Texas/Louisiana | Oakford PA | 1.996 | NA | 11/01/04 | 10/31/09 |
| Oakford PA | Lambertville NJ | 1.951 | NA | 11/01/04 | 10/31/09 |
| Texas/Louisiana | Lambertville NJ | 10.731 | NA | -- | 10/31/12 |
| Texas/Louisiana | Lambertville NJ | 7.918 | NA | 11/01/05 | 10/31/12 |
| **Maritimes & Northeast Pipeline** | | | | | |
| Goldboro NS | St. Stephen NB | 43.200 | NA | -- | 3/31/07 |
| St. Stephen NB | Dracut MA | 43.200 | NA | -- | 3/31/07 |
| **Tennessee Gas Pipeline** | | | | | |
| PA / New York | KeySpan city gates | 13.027 | NA | -- | **10/31/03** |
| Central U.S.; Mid-Atlantic | KeySpan city gates | 80.165; 14.147 | NA | -- | **10/31/03** |
| Niagara | KeySpan city gates | 10.533 | NA | -- | **1/14/03** |
| Wright NY | KeySpan city gates | 8.600 | NA | -- | 11/30/12 |
| FS-MA (PA) | KeySpan city gates | 41.687 | NA | -- | **10/31/03** |
| Dracut MA | KeySpan city gates | 43.200 | NA | -- | 3/31/07 |
| FS-MA (PA) | KeySpan city gates | 7.504 | NA | -- | **10/31/03** |
| Wright NY | KeySpan city gates or Mendon MA | 4.000 | NA | -- | 10/31/12 |
| Wright NY | KeySpan city gates or Mendon MA | 2.000 | NA | -- | 11/30/11 |
| Central U.S.; Mid-Atlantic | KeySpan city gates | 21.4; 3.761 | NA | -- | **10/31/03** |

| | | | | | |
|---|---|---|---|---|---|
| Central U.S.; Mid-Atlantic | KeySpan city gates | 14.686; 2.614 | NA | -- | 3/31/13 |
| Nat'l Fuel Storage, FS-MA | KeySpan city gates | 16.083 | NA | -- | **5/31/03** |
| FS-MA | KeySpan city gates | 4.069 | NA | -- | 5/13/03 |
| Central U.S.; Mid-Atlantic | KeySpan city gates | 13.369; 2.359 | NA | -- | 10/31/03 |
| Wright NY | KeySpan city gates | 2.000 | NA | -- | 11/30/11 |
| Niagara | KeySpan city gates | 0.976 | NA | -- | 1/14/03 |
| Niagara | KeySpan city gates | 0.645 | NA | -- | 1/14/03 |
| FS-MA | KeySpan city gates | 5.172 | NA | -- | 10/31/03 |
| **Iroquois Gas Transmission System** | | | | | |
| Canada | Wright NY | 8.645 | NA | -- | 11/01/11 |
| Canada | Wright NY | 6.070 | NA | -- | 10/31/11 |
| Canada | Wright NY | 2.023 | NA | -- | 10/31/11 |

| | | | | | |
|---|---|---|---|---|---|
| **Alberta Northeast, Ltd.** | | | | | |
| western Canada | Waddington NY | 8.6 | 3139 | -- | 10/31/06 |
| western Canada | Waddington NY | 2.0 | 730 | – | 10/31/06 |
| western Canada | Waddington NY | 6.0 | 2190 | -- | 10/31/06 |
| **Boundary Gas, Inc.** | | | | | |
| western Canada | Niagara NY | 1.621 | 591.7 | -- | 1/14/03 |
| western Canada | Niagara NY | 10.533 | 3844.5 | -- | 1/14/03 |
| **National Fuel Supply Corporation** | | | | | |
| NFSC | NFSC | 6.203 | 930.4 | -- | 3/31/03 |
| Transportation service associated with NFSC storage contract | | | -- | 3/31/03 | -- |

NA: not available from cited sources.
(Exhs. KEY-1, at 94-109; DTE 3-3; DTE 3-4; DTE 3-5; DTE 3-7)
[1] After the close of evidentiary hearings, the Company filed an additional Service Agreement with Algonquin.

**ATTACHMENT C: KeySpan Gas Storage Contracts**

| Location of Gas Storage | Max. Daily Quantity or Withdrawal Rate (BBtu) | Annual Quantity or Capacity (BBtu) | Contract Modification Date (if any) | Contract Termination Date |
|---|---|---|---|---|
| **National Fuel Supply Corporation** | | | | |
| Pennsylvania, New York | 6.203 | 930.4 | -- | 3/31/03 |
| **Honeoye Storage Corporation** | | | | |
| New York | 6.150 | 981.1 | -- | year-to-year |
| **Dominion Transmission Inc.** | | | | |
| PA / WV / NY | 42.457 | 4,698.1 | -- | 3/31/06 |
| PA / WV / NY | 11.000 | 823.5 | -- | 10/31/06 |
| PA / WV / NY | 1.049 to 2.222 | 188.9 to 222.2 | 11/01/02 | 3/31/12 |
| PA / WV / NY | 0.050 to 0.104 | 8.8 to 10.4 | 11/01/02 | 3/31/12 |
| PA / WV / NY | 0.017 | 1.6 | -- | 10/31/02 |
| PA / WV / NY | 0.335 | 33.3 | -- | 10/31/02 |
| **Texas Eastern Transmission Company** | | | | |
| PA / MD / WV / NY | 68.771 | 4,938.1 | -- | 4/30/13 |
| PA / MD / WV / NY | 6.969 | 493.5 | (*prior mod.*)[1] | 4/30/13 |
| **Tennessee Gas Pipeline** | | | | |
| PA / NY | 70.799 | 5,686.0 | (*prior mod.*)[1] | 10/31/03 |
| PA / NY | 14.150 | 1,095.3 | -- | 10/31/03 |
| PA / NY | 10.466 | 821.4 | -- | 10/31/03 |
| **Algonquin LNG, Inc.** | | | | |
| Providence (above-ground) | 35.000 | 1,159.7 | -- | 10/31/07 |

[1] "*prior mod.*"-- Modification prior to year 2002.

(Exhs. KEY-1, at 106-110; DTE 3-6; Tr. at 117-118)

**ATTACHMENT D. KeySpan Local Gas Storage Facilities**

| Location of Facility | Maximum Daily Vaporization (BBtu) | Storage Capacity (BBtu) | Fuel Stored |
|---|---|---|---|
| **KeySpan Energy Delivery of New England** | | | |
| Commercial Point (Dorchester) | 190 | 1,198.0 | LNG |
| Haverhill | 42 | 477.4 | LNG |
| Lynn | 86.4 | 1,053.4 | LNG |
| Salem | 15 | 1,050.6 | LNG |
| South Yarmouth | 27 | 165 | LNG |
| Tewksbury | 64.8 | 1,097.0 | LNG |
| Wareham | 2.5 | 8.4 | LNG |
| Westford | 7.8 | 5.1 | LNG |
| Cataumet | 0 | 246.0 | propane |
| Chatham | 0 | 4.7 | propane |
| Danvers | 23.1 | 90.0 | propane |
| Everett | 40 | 720.0 | propane |
| Gloucester | 3.9 | 60.0 | propane |
| Haverhill | 0 | 218.0 | propane |
| Leominster | 0 | 60.0 | propane |
| Lowell | 25 | 485.0 | propane |
| Norwood | 5.4 | 60.0 | propane |
| Southbridge | 6 | 30.0 | propane |
| South Yarmouth | 0 | 120.0 | propane |
| Spencer | 3.6 | 18.0 | propane |

(Exhs. KEY-1, at 112; DTE 3-9; Tr. at 119)